

Modiolus aurum Osorio, spec. nov.,
from Juan Fernández Archipelago, Chile

(Mollusca : Bivalvia : Mytilidae)

BY

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(9 Text figures)

INTRODUCTION

IN 1970 I RECEIVED 21 specimens of *Modiolus* from Juan Fernández Archipelago. Specific identification was not possible, because of encrusting epizoans. In 1973 another sample of 97 specimens came in, not only without epizoans, but more representative and in better condition. Some additional specimens then were noted in the collections of the National Museum of Natural History of Santiago.

ODHNER (1922) cited "*Modiola plumescens* Dunker, 1868" as occurring on Juan Fernández Island, but SOOT-RYEN (1959) suggested that until confirmed by further collecting this species should not be included in Chilean faunal lists. The specimen mentioned by Odhner as in the Stockholm Museum seems now to be missing. However, other specimens, from Australia, determined by Odhner as *M. plumescens*, were available to me on loan. Also I examined material from Île Nou and Broome, Australia, now in the Museum of Paris. The type locality of Dunker's species is Samoa, Viti-Ins, Uvea.

Because Odhner had only a single specimen from Juan Fernández on which to base his determination of "*Modiolus plumescens*," misidentification is understandable. The 2 forms have a similar outline. Table 1 shows the differences between the Australian and the Juan Fernández forms. As a result of the comparative study I conclude that there are 2 distinct species. For the Juan Fernández form, which is therefore considered to be undescribed, I propose the name *Modiolus aurum*, in reference to the golden color of the shell.

SYSTEMATIC TREATMENT

MYTILIDAE

Modiolus Lamarck, 1799 (*nom. conserv.*, ICZN, 1955)

Modiolus aurum Osorio, spec. nov.

(Figure 1)

"*Modiola plumescens* Dunker" of ODHNER, 1922: 221. SOOT-RYEN, 1959: 25. OSORIO & BAHAMONDE, 1970: 192. (Non *Modiola plumescens* DUNKER, 1868: 115; 1875: 175).

Description: Shell mytiliform, relatively high; dorsal margin curved, with a pronounced dorso-posterior angle; anterior margin narrow, rounded at the tip; posterior margin broad, evenly rounded; ventral margin straight. Beaks evident, located slightly behind the anterior end, close together, ligaments not evident. External surface of shell with evident periostracum of a golden-yellow color with greenish and brownish hues; periostracum well developed dorsally, becoming weak or wanting anteriorly; periostracal hairs of several patterns (Figure 2), type a-b occurring only near the umbones of larger specimens but over entire surface of small individuals; type c-d occurring only on the dorso-posterior end of large specimens; all hairs with a smooth axis, lacking denticulations.

A heart-shaped lunule present, anterior to the beaks.

Hinge area completely smooth within, broad (Figure 4), ligamental area elongate, slightly curved (Figure 4), originating behind beaks.

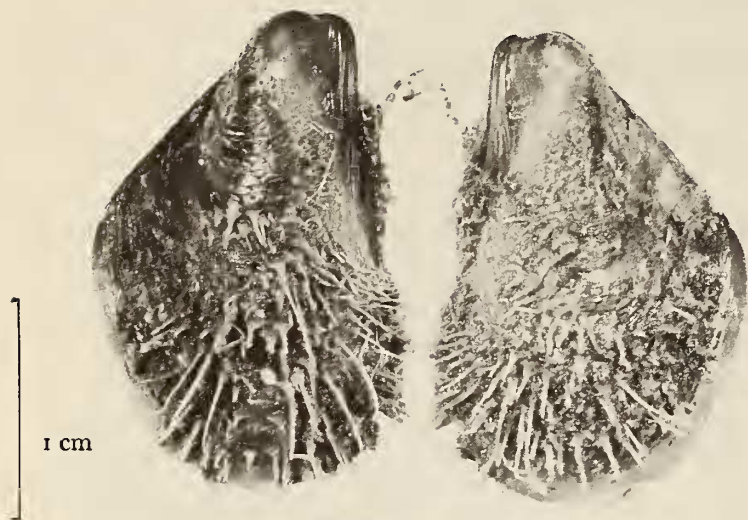


Figure 1

Modiolus aurum Osorio, spec. nov.

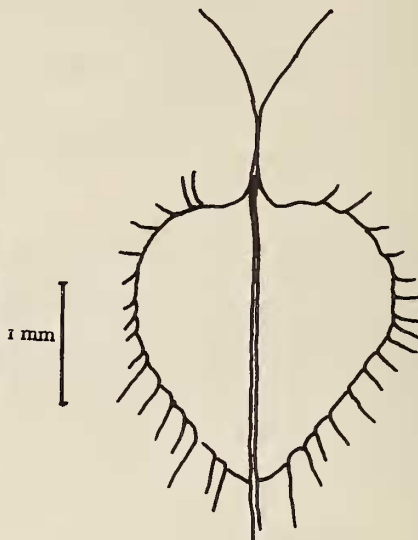


Figure 3

Lumule

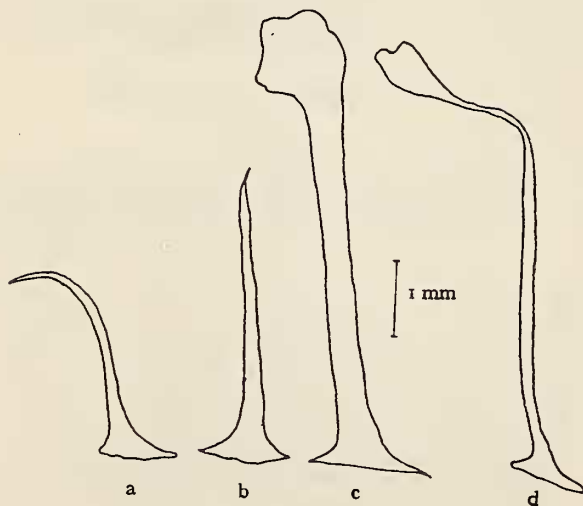


Figure 2

Different forms of "hairs" of the periostracum of *Modiolus aurum*

Muscle scars well marked, the posterior adductor sub-circular, continuous with retractor muscles, separated into 2 groups; anterior adductor small.

According to SOOT-RYEN (1955), the anatomical structures of the branchial openings have systematic val-

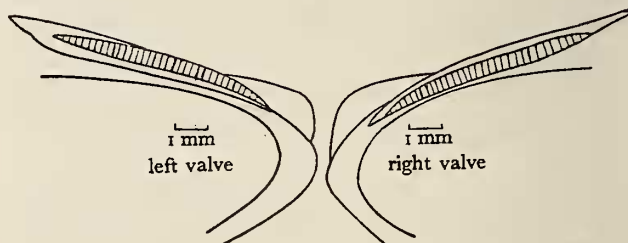


Figure 4

Interior surface of the shell, hinge area and ligament

ue; these were especially examined. The exhalant or dorsal branchial opening is oval, with thick, smooth, and well defined margins; the inhalant or ventral branchial opening is separated from it by a broad septum, the membrane prolonged laterally and slightly festooned, forming a fold that is continuous with the mantle lobules.

Type Material: Holotype, in Museo Nacional de Historia Natural, Santiago, Chile, no. 100230. Two paratypes, A 100231, B 100232. One hundred additional paratypes in the author's collection.

Dimensions: Size of holotype: length, 26.7 mm; width, 15.7 mm. Paratype A, length, 26.3 mm, width, 15.6 mm;

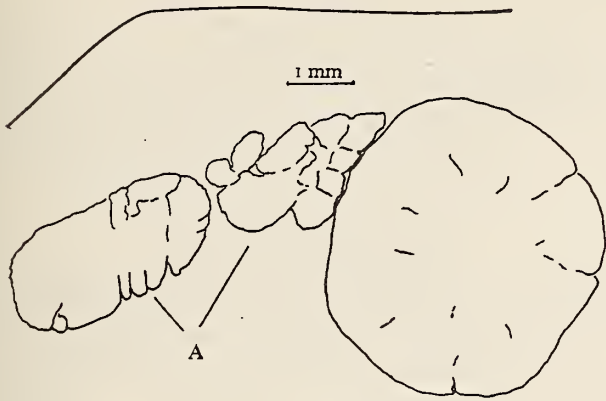


Figure 5

Muscular scars

A - retractor muscles

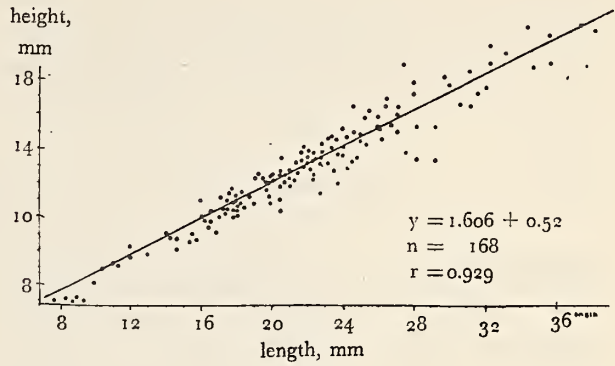


Figure 7

Proportion of length to height

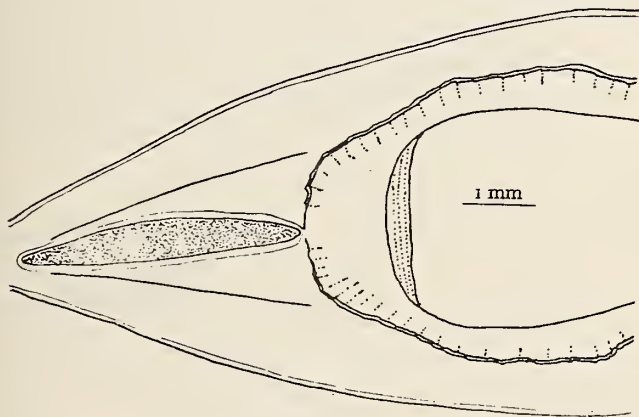


Figure 6

Branchial openings in *Modiolus aurum*

Paratype B, length, 21.8 mm, width, 13.2 mm.

Type Locality: Bahía Cumberland (Lat. 33° 37'S; Long. 78° 49'W).

Date: 18 April 1973.

Collectors: C. Moreno and J. Zamorano.

Substrate: on buoys or adhered to coastal rocks.

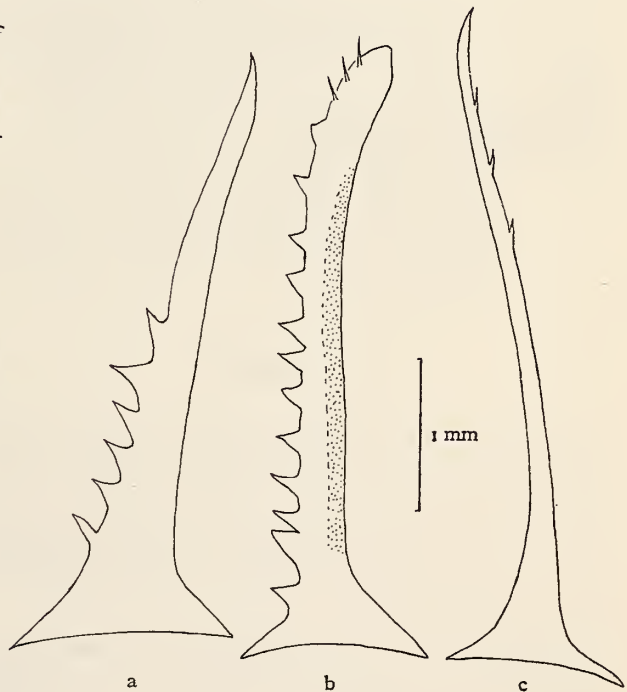


Figure 8

Different forms of "hairs" of the periostracum of *Modiolus plumescens* Dunker, 1868

Table 1

Morphological differences between *Modiolus aurum* and *Modiolus plumescens*.

Characters	Species	
	<i>Modiolus aurum</i> Osorio, spec. nov.	<i>Modiolus plumescens</i> Dunker, 1868
Colour	Shells golden-yellow, with brown hues.	Shells brown-olivaceous, with reddish hues.
Lunule	Heart-shaped, small, circumscribed by a deep line (Fig. 3).	Oval, big, occupying half of the total length, circumscribed by a slight line.
Periostracum	"Hairs" of different form, axis smooth, without denticulations or membranes and its free end with diverse forms (Fig. 2).	"Hairs" of more or less similar form, axis with denticulations in a row, and its free end more or less pointed (Fig. 8).
Branchial openings	(Fig. 6). Dorsal relatively large, oval, margins smooth and well defined. Ventral clearly separated from the dorsal opening by a septum. The lateral membrane of the ventral opening terminates between the two openings.	(Fig. 9). Dorsal relatively small, oval with its inferior margin truncated. Ventral very near the dorsal opening, septum small. The lateral membrane of the ventral opening terminates by intruding into the dorsal opening.

Depth: 0 to 45 m from littoral pools to submerged objects.

Geographical Distribution:

Juan Fernández Archipelago:

- a) Robinson Crusoe Island in beaches of El Panagal, Palillo and Cumberland Bay.
- b) Alexander Selkirk Island (place of collection was not indicated).

DISCUSSION

Length-width relationships are shown in Figure 7. The linear regression was estimated, based on analysis of 168 specimens. The formula is: $y = 1.606 + 0.52x$ for the Juan Fernández population. The largest specimen measured 38.2 mm in length, 20.8 mm in width. Morphologic differences between *Modiolus aurum* and *M. plumescens* may be shown as follows.

SOOT-RYEN (1955) lists 8 species for the western coast of America, from among which KEEN (1971) indicates only 3 for South America:

Modiolus capax (Conrad, 1837) – Santa Cruz, California to Payta, Perú

Modiolus eiseni Strong & Hertlein, 1937 – Gorda Bank and Guaymas, Gulf of California to Perú

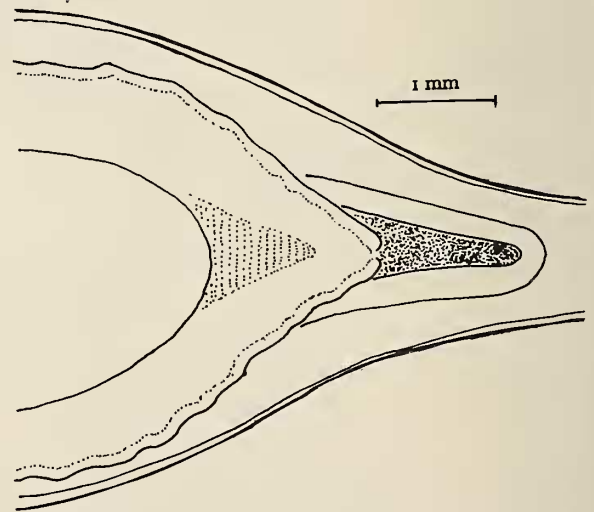


Figure 9

Branchial openings in *Modiolus plumescens* Dunker, 1868

Modiolus pseudotulipus Olsson, 1961 – Bahía Magdalena, Lower California to Perú.

All these are from tropical waters and are distinctly different from *Modiolus aurum* in form of shell, periostracal hairs, lunule, muscle scars, and branchial openings. Only *M. pseudotulipus* has a similar outline, but the unbranched periostracal hairs, broad base, and the lateral membrane distinguish it clearly from *M. aurum*.

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